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It would be rash in our present knowledge to say that all influences made upon the germ are of the transmitting type; but as to this case of artificial epilepsy we may affirm that such evidence as we have points to general and even special heredity of acquired character through some affection of the germ produced by that character. A nervous disorder, epilepsy, tends to produce in offspring some nervous disorder. It is plain that if there is any effect upon the offspring from this disease, it is upon the nervous tissue rather than upon any other tissue or function, and this deserves to be called general heredity; and so far as the special disorder is communicated, this may be called specific heredity. If a nervous disease tends to produce in offspring nervous disease of any kind, this is so far heredity.

It seems to me, then, that Prof. Weismann's theory of non-transmissibility of acquired character fails even when tried by his own presentation of this test case, but it is certainly to be desired, as he intimates (p. 82) that the series of experiments should be carefully and thoroughly followed up. We certainly owe much to Prof. Weismann's hypothesis, but it is not too much to say that it is still unproved in point of fact, and unsatisfactory as yet to the scientific imagination, at least so far as artificial epilepsy is conserved.—HIRAM M. STANLEY.

ARCHÆOLOGY AND ETHNOLOGY. ¹

Prof. F. W. Putnam, Curator of the Peabody Museum of American Archæology and Ethnology, in Cambridge, closes his last report in the following manner :

“Thus there are the following elements to be taken into consideration in any endeavor to trace the present North American tribes and nations back to their origin. First, small, oval-headed, paleolithic man. Second, the long-headed Eskimo. Third, the long-headed people south of the Eskimo. Fourth, the short-headed race of the southwest. Fifth, the Carib element of the southeast. All these elements must be studied with their differences in physical characteristics, in arts and in languages. From a commingling of all, with greater or less predominance of one over the other, uniting here and subdividing there, through many thousand years, there has finally resulted an American people having many characteristics in common, notwithstanding their great diversity in physical characteristics, in arts, in customs and in languages. To

¹ This department is edited by Thomas Wilson, Esq., Smithsonian Institution, Washington, D. C.

this heterogeneous people the name Indian was given, in misconception, nearly four hundred years ago, and now stands as a stumbling-block in the way of anthropological research ; for under the name resemblances are looked for and found, while differences of as great importance in the investigation are counted as mere variations from the type.

"It is in such museums as this at Cambridge that the facts are now being gathered, and we may hope in time to be able to determine aright the complicated history of the ancient people of America."

Without sanctioning the classification of human races in North America, adopted as above by Prof. Putnam, I cite with commendation and approval the idea expressed in the last paragraph. The average archæologist of the United States has been in times past but little more than a collector of Indian relics. He sought to gather or obtain rare or handsome objects, and these qualities measured their value in his eyes. Such collections, viewed from the standpoint of the real archæologist, are of but little if any value. Their real service to the science of archæology begins when they shall be put to the use suggested by Prof. Putnam ; when, in either large or small collections, better in the former, they can be spread out, assorted, classified and divided, they may assist in determining the races of people, as has been attempted by Prof. Putnam in the foregoing paragraph.

Classification of Arrows or Spear-heads or Knives in the National Museum.—Collectors of Indian relics have gathered in all times past quantities of arrow-heads, called "flints," but usually without any attempt at classification or arrangement. The National Museum has sought to make a classification by which these implements may be recognized and described. Such an attempt was made some years ago, but the divisions were so close and the distinctions so finely drawn that it was scarcely possible to follow them. It made so many classes that one could not remember them all, nor identify to which one a given object belonged. In the classification just made the divisions have sought to be broadened and the lines between them deeply drawn and easily recognized. It is as follows :

STONE ARROWS OR SPEAR-HEADS OR KNIVES.

Class—Leaf-shaped—Sub-class A. Thin and finely-chipped implements of the form of a laurel leaf—elliptical and pointed at both ends. They correspond substantially with the French Solutreen type of the Paleolithic period of the Stone Age.

Sub-class B. These may be thicker and ruder than Sub-class A. Some are more oval, and the bases are not pointed, but are either

straight or convex. This class includes the leaf-shaped argillite implements found by Dr. Abbott in the Delaware river gravels at Trenton, N. J.

Sub-class C. Long, thin blades, with nearly straight edges, more like a dagger or poignard. The base may be either convex, straight or concave. Many of them show traces of attachment to a handle by means of bitumen or gum. They are peculiar to the Pacific Slope.

Triangular.—This class includes all forms approaching a triangle, whether the bases or edges be convex, straight or concave. They are without stems, and, consequently, without shoulders, but in some specimens the concavity of the base produces barbs.

Stemmed.—This class includes all varieties of stems, whether straight, pointed or expanding, and all varieties of bases and edges, whether convex, straight or concave.

Sub-class A. Lozenge-shaped.

Sub-class B. Shouldered, but not barbed.

Sub-class C. Shouldered and barbed.

Note. Nearly all of these convex bases are smooth, as though they had been worn. The purpose or cause of this is unknown.

Peculiar forms.—These have such peculiarities as distinguish them from all other classes, but by reason of their restricted number or locality can scarcely form a class of themselves.

Sub-class A. Beveled edges. The bevel is almost always in one direction.

Sub-class B. Serrated edges.

Sub-class C. Bifurcated stems.

New Archæological Discoveries.—These seem to be made in every land with about equal frequency. I have wondered if the average archæologist (I do not expect it of mere collectors) has ever thought of the evidence afforded by the number of these discoveries as to the length of time of prehistoric human occupation, or the density of the prehistoric population. As mere finds of stone hatchets or arrow-heads, spear-heads or knives, bits of pottery, shell, bone, etc., these discoveries are regarded by the finders as of value only to the amount of money for which the objects can be sold. This value is practically nothing compared with what it might be to science if the locality, conditions, association of the objects when found, were accurately noted and truthfully recorded, so as to be used in making up the history of prehistoric man.

Archæologic or Archæological.—Which is correct, or are both correct? Is there any difference in their meaning, or any distinction in the phrases or senses in which they can be used? If both words mean exactly the same thing, why not discard one or the other, and why use them indifferently?

Human and Animal Remains.—(Dr. J. L. Wortman).—The proper collection and preservation of human and animal remains is important. Not infrequently, material of high scientific value is allowed to perish through lack of knowledge of effective method of preservation. Some of the methods are so crude, and the skill of collectors so primitive, that the material when collected is almost worthless. Many remains looked upon by the inexperienced as hopelessly decayed, can, in the hands of the experienced collector, be made of interest and importance to science.

It is a popular error that the anatomist can restore or reconstruct a skeleton from a few scattered fragments. Where the structure of the animal is known this may be done, but with imperfectly known species the entire skeleton is indispensable to a complete knowledge of its osteology. This is true of the human species for the determination of these racial differences or affinities displayed in their skeletons. For these purposes not only one, but many skeletons may be required, and it should be the object of the collector to provide the requisite material, and in such a condition as to be of the highest possible scientific value.

The best method of procedure is perhaps open to question. It depends upon a variety of conditions, such as character of matrix or soil, the condition of the skeleton, its state of preservation, mode of burial, etc. The best method of procedure can only be indicated in a general way. Suppose a skeleton rather friable, buried in loose, dry earth. How shall he proceed? Unnecessary and dangerous explorations with the coarser instruments, such as pick and shovel, must be avoided. Approaching the skeleton, he should explore it with care, using some small instrument, say a hand-trowel. He should make due allowance for the prominences, as the anterior superior curve of the spine, possibly the ribs, as they are frequently found in their natural position; the frontal eminence of the skull, etc.

After the superimposed earth has been removed, cut a trench a foot or so deep on either side of the skeleton, at enough distance to avoid injury to any of the bones—this for convenience in removing the earth from around the bones. Begin at either the head or feet, and remove the dirt bit by bit with the trowel, supplemented by small scrapers of

wire flattened and ground to a chisel edge. These will be useful in cleaning out the cavities. The earth can be brushed away, and the specimens kept clean for observation, using softer brushes as required, so that no injury may be done to the bones. If the specimen crumbles upon exposure to the air, so as to endanger its safety, expose only a small surface of the bone at a time, apply the preservative, and let it dry, after which a little more can be exposed, and so continued until the skeleton is finished.

If the bones are in a fair state of preservation, an entire skull, or, for this matter, the whole skeleton, may be exposed, cleaned with the brush, and the preservative applied. Before applying the preservative remove the dirt thoroughly from the surface of the bone. If this is neglected the preservative when applied will cause the dirt or earth allowed to remain to adhere so firmly that it cannot afterwards be removed without serious damage to the specimen.

Take a skull, for example, part of a skeleton buried in its natural position. One would begin, say at the forehead, and remove the dirt, little by little, until the whole is more or less exposed, using the small implements according to necessity; and so continuing, with care that the bone is not broken, until the whole is neatly and thoroughly cleaned. It is a good practice to leave the dirt in the deeper parts of the cavities, such as the nose, the deeper parts of the orbits, etc. Next use the preservative, giving a thin coat upon the more exposed portions, avoiding for the present the uncleaned cavities, that no dirt may be cemented to any portion of the bone. After the preservative is well dried remove the skull from its bed, taking special pains to avoid breaking it. Next remove the lower jaw, being watchful that none of the teeth are lost, clean the cavities and the interior, and finally paint it thoroughly both inside and outside with the preservative.

In the vicinity of where the root of the tongue has been will generally be found the hyoid or tongue bone or bones. In the adult or aged person they generally consist of one piece, somewhat in the form of the letter U, but in the young, and sometimes in the old, they consist of separate pieces. They should always be preserved with the greatest care, and placed with the skull to which they belong. The collector should familiarize himself with their appearance, either by examining a recent skeleton or by consulting some standard work upon human anatomy. This method can be continued for the rest of the skeleton, and can be employed for other animal remains.

The preservative which has proved best in my hands (and I speak from a large experience with almost all known material) is the ordinary shellac dissolved in commercial alcohol. The first coat or two I use tolerably thin so that the porous bone may take it up. It may be found necessary to use several coats before the specimen can be handled, and it is always best to finish off with a thick solution. The judgement and experience of the collector must be his guide in this matter, as it is impossible to lay down any definite rule.

Notwithstanding many coats of shellac the articular extremities of the long bones may be still friable, while their shafts are moderately strong. This I have been able to remedy by plunging them (the articular ends) into hot wax. The wax should not be too hot nor should they be left in too long. A minute or two is enough for their complete saturation. It may also be necessary to give the bodies of the vertebrae and the weaker parts of the innominate bones to a similar treatment.

The foregoing description applies to skeletons buried in dry earth. Where it is damp or wet no attempt should be made at removal until the earth is dry. All but two or three inches of the super-imposed earth can be removed, and left for a few days' sunshine to put it in proper condition. Loose teeth or fragments of bone should be carefully gathered up, wrapped in separate packages and placed with the skeleton. Every bone should be preserved and nothing thrown away.

Instructions for the proper packing and shipment of skeletons can be briefly stated as follows: Number each skeleton and pack it in a separate box. If the skull is unusually liable to breakage it is a good plan to provide a separate box for it also, but it should bear the same number as the skeleton to which it belongs. It will be found that the best material for packing is either soft paper, chaff, or very soft straw or hay, and after each layer sift the interstices *full* of sawdust or bran. This, if well done, will prevent all movement or shaking of the specimens. Breakage of this kind is fatal, and generally results in permanent injury to the specimen.

What has been said as to the preservation of human remains applies more to skeletons buried in mounds or graves, and surrounded by loose soil. In the case of cave burial the bones are generally surrounded by or enclosed in a hard lime cement, which cannot be removed except with hammer or chisel, requiring the appliances and skill of a well-appointed laboratory. In all cases of this kind it is best to take the specimen out in a block of the matrix if possible, and pack as before directed, and ship it in this condition.—J. L. WORTMAN.